

## REPORT ON THE SHEPHERD AND MURPHY'S TIN MINE, BELL MOUNT.

Mines Office, Lancaster, July 26th, 1897.

SIR,

On the 5th of June, in accordance with instructions, I visited the Shepherd and Murphy's Tin Mine, Bell Mount, and have the honour to present the following brief Report thereon:—

This property is situated 22 miles south-west from Sheffield, at an elevation of about 2000 feet above sea level. The River Forth is crossed at an elevation of 250 feet, 9 miles west from Sheffield, the rise on either side being very steep. The road passes most of the way through rich agricultural land of a chocolate colour, characteristic of the weathering of basalt. Going down into the Forth valley a small belt of sandstone and conglomerate is crossed, but basalt is again seen on the other side of the river, and the land has been taken up for agricultural purposes for some six miles further. About 2½ miles from the bridge the road junctions with the road running down the Forth valley to Leith, and thence continues in a southerly direction along the divide between the Forth and Wilmot Rivers. The road has been cleared to the end of the agricultural holdings, (about 15 miles from Sheffield), but the last three miles are only partly formed. From this point, Hall's surveyed track to Middlesex was followed; the grade is on the whole good, but the track is even now almost impassable in places, and with much traffic would become quite so. The basalt country, covered with dense myrtle forest, continues as far as Bell Mount, where slates, sandstones, and conglomerates are seen, but the basalt again occurs about two miles further south, and continues, I believe, as far as Middlesex Plains.

The Shepherd and Murphy Tin Mining Company, No Liability, originally held Sections 1437-91M and 1456-91M, of 80 acres each, but Section 2134-91M, of 78 acres, known as Sykes' section, lying to the east of the other two, has been recently purchased. The greater part of the southern section (1456) and the western portion of 1437 is covered with basalt, but on the east sandstones, quartzites, and slates are seen. The principal workings are situated on the eastern half of block 1437, on a ridge sloping to the north between two small creeks which run through the section a little west of north, and junction with what is known as the Seven-mile Creek. Crossing this ridge in an east and west direction, a series of six small parallel quartz lodes have been discovered at distances of one to two chains apart, carrying oxide of tin, sulphide, and carbonate of bismuth, and wolfram; topazes, too, are occasionally found.

The most northerly lode yet discovered, known as No. 6 Lode, is exposed in a long trench, and shows about a foot wide of quartz containing crystals of oxide of tin. In one place it is split into two veins of about ten inches each, separated by a "horse" of sandstone, and on the southern wall is a soft clayey vein very rich in tin. I saw several dishes washed from the stuff broken from this lode, which all gave good prospects of coarse crystalline tin ore, but little or no bismuth or wolfram.

Very little work has been done on No. 5 lode; where exposed, it is from six to nine inches wide, and contains both tin and bismuth. On No. 4 lode, about a chain higher up the hill, a good deal of trenching has been done, and a tunnel driven 150 ft. along its course from the fall into the eastern creek. Where cut on the surface it was only about eight inches wide, but in the tunnel it was in places over two feet wide, the average width being about a foot. One very rich shoot of sulphide and carbonate of bismuth was cut, and the lode also contains a good deal of tin ore and wolfram. Several small parcels of hand-picked bismuth ore were obtained by former tributors from a deep trench along this lode, and the company is now sluicing the stuff thrown on one side, with very good results. This lode has, I believe, been traced through Sykes' section into Section 1-93M, further to the east, but I had no time to examine these sections.

On No. 3 lode there is a shallow trench, about 3 chains long, and what is probably the continuation of this lode, has been cut in the bottom of a deep trench running in a south-east direction on the west side of the hill. This cross trench also connects with a deep trench about six chains long on No. 2 lode, which gives good prospects for tin and bismuth, but is small. Small crystals of tin ore can also be obtained in places by crushing the soft friable enclosing sandstone. To the west the lode dips under the alluvial.

No. 1 lode, several chains south of No. 2, is about six inches wide, but very little work has been done on it.

Near the southern boundary of the section several shallow trenches have been cut through surface stuff, giving fair prospects of tin and a little gold, so it is probable that other lodes exist under the basalt further south. In the northern part of the section good prospects for tin, with a few colours of gold, can be obtained from the surface stuff, mainly of basaltic origin, which is here of considerable depth. To the west of the Western Creek a shaft was sunk to a depth of 20 feet through waterworn wash, which is said to contain tin and gold, but I did not see this.

In the cross trench above alluded to from No. 2 lode, the wash is in places about 10 feet deep, and gives good prospects for tin and bismuth. The bed-rock dips to the west, and everything points to the existence of deep ground under the basalt to the west of the creek, and to the east there is a considerable quantity of ground which should be worth sluicing if a good supply of water were available. The fall from the southern to the northern boundary of this section is nearly 400 feet, so that there are good natural facilities for sluicing, but the present water supply is quite inadequate for extensive operations. Mr. Mitchell, the mine manager, informed me that a good supply could be obtained from what is called the Weaning-paddock Creek, by cutting a race some five miles in length, and steps are being taken to have a survey made. A small but effective dressing shed has been erected in which the ore obtained by sluicing is further concentrated, and there are now about four tons of concentrates ready for shipment. These "concentrates" contain tin ore, wolfram, and carbonate and sulphide of bismuth, but I do not know in what relative proportions. It is impossible to make a complete separation of these minerals mechanically owing to their specific gravities being so close together, and the concentrates will be shipped to England for further treatment.

The directors of the company are hopeful of being paid for the wolfram as well as the tin and bismuth contents, but, as the separation involves costly treatment, the charges will be proportionately high. Hitherto the only ore shipped has been hand-picked bismuth ore, and Mr. Hinman has kindly shown me a copy of the account sales dated 18th March, 1897, of three small parcels totalling 19 cwts. The ore assayed from 57.1 to 60.1 per cent. bismuth, which was paid for at the rate of 3s. 11d. per lb., and the gross value of the 19 cwts. was £243 8s., but the charges for sampling, assaying, commission, &c. amounted to £24 10s., reducing the net value to £218 18s. The demand for bismuth is very limited, but even if the price should fall considerably a good margin of profit should remain. The lodes are small, but an effort should certainly be made to prove them at a greater depth, and this could best be done by driving adits in a southerly direction across their course. These lodes are probably connected with the granite which occurs further to the east in the old Dolcoath Company's ground. At present it costs £7 per ton for carriage of ordinary mining supplies from Sheffield to the mine, and for rations 1d. per lb., ore being taken as back freight for £3 10s. per ton, and a better track from the end of the made road is urgently required.

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J. HARCOURT SMITH, B.A., *Government Geologist.*

*The Secretary for Mines, Hobart.*